

REMARKS

Claim 1 has been amended to replace the first instance of the transitional phrase “comprising” with the transitional phrase “consisting of,” to recite a portion of the subject matter of claim 16, and to delete the limitation that the solid pyrotechnic composition is free of sulfur. Claims 5, 16, and 68 have been amended to improve clarity. Claims 17-21 have been amended to correct claim dependencies. Support for the amendments is found in the as-filed application at at least paragraphs [0025], [0030]-[0032], [0036], and [0047]- [0051].

The Final Office Action mailed February 13, 2007, has been received and reviewed. Claims 1-8, 10-14, 16-25, 68, and 69 are currently pending in the application. Claims 11-14, 20, 21, 23-25, 68, and 69 are withdrawn from consideration. Claims 1-8, 10, 16-19, and 22 stand rejected. Applicant proposes to amend claims 1, 5, 16-21, and 68, and respectfully requests reconsideration of the application as proposed to be amended herein.

The amendments to claims 1, 5, 16-21, and 68 should be entered by the Examiner because the amendments place the application in condition for allowance. Alternatively, the amendments place the application in better form for appeal.

Supplemental Information Disclosure Statement

Please note that a Supplemental Information Disclosure Statement was filed herein on September 21, 2006, and that no copy of the PTO/SB/08A was returned with the outstanding Office Action. Applicant respectfully requests that the information cited on the PTO/SB/08A be made of record herein. It is respectfully requested that an initialed copy of the PTO/SB/08A evidencing consideration of the cited references be returned to the undersigned attorney.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 5,449,423 to Cioffe

Claims 1-8 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,449,423 to Cioffe (“Cioffe”). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for an obviousness rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The obviousness rejection of claims 1-8 and 22 is improper because the cited references do not teach or suggest all of the claim limitations and do not provide a motivation to produce the claimed invention.

Cioffe teaches an explosive composition that includes potassium perchlorate, an organic or inorganic nitrate, and an organic acid or salt of the organic acid. Cioffe at column 1, line 60 through column 2, line 2. The organic acid has a chemical formula of $C_6H_8O_6$ and includes ascorbic acid, erythorbic acid, 5,6-carbonyl ascorbic acid, 5,6-erythorbic acid, D-glucuronolactone, isoascorbic acid, tricarballic acid, salts thereof, or mixtures thereof. *Id.* at column 5, lines 38-45. Organic acids "having more than 6 carbon atoms but which have similar reactivity may also be used." *Id.*

Cioffe does not teach or suggest all of the limitations of claim 1, as proposed to be amended. As acknowledged by the Examiner, Cioffe does not teach or suggest "the claimed organic crystalline particle[s]." Office Action of February 13, 2007, p. 2. Therefore, Cioffe does not teach or suggest the limitation in claim 1 of "organic crystalline particles accounting for from about 10 weight percent to about 60 weight percent of the total weight of the solid pyrotechnic composition, wherein the organic crystalline particles comprise an organic crystalline compound comprising at least one of phenolphthalein, an organic crystalline compound derived from a reaction between a phenolic compound and phthalic anhydride, fluorescein, 1,5-naphthalenediol, and terephthalic acid." Since Cioffe does not teach or suggest the recited organic crystalline compounds, Cioffe necessarily does not teach or suggest that its explosive composition consists of the components recited in claim 1.

Cioffe also does not provide a motivation to produce the claimed invention. To provide a motivation or suggestion to combine, the prior art or the knowledge of a person of ordinary skill in the art must “suggest the desirability of the combination” or provide “an objective reason to combine the teachings of the references.” M.P.E.P. § 2143.01. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” M.P.E.P. § 2142. “In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” M.P.E.P. § 2143.

The Examiner relies on Cioffe as suggesting terephthalic acid and states that “[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to use terephthalic acid (with 8 carbons) since Cioffe discloses that similar compounds to ascorbic acid with more than 6 carbons may be used.” Office Action of February 13, 2007, p. 2. Applicant respectfully disagrees and submits that this line of reasoning is not sufficient to support a *prima facie* case of obviousness of claim 1. While Cioffe teaches that organic acids having more than six carbon atoms may be used in its explosive composition, Cioffe also teaches that such organic acids have a similar reactivity to the $C_6H_8O_6$ compounds. However, Cioffe does not provide examples of organic acids with more than six carbon atoms having a similar reactivity to the $C_6H_8O_6$ compounds. Cioffe also does not provide any teaching or suggestion for determining compounds having the desired similar reactivity. Furthermore, the Examiner has provided no objective evidence to show that terephthalic acid has a similar reactivity to the $C_6H_8O_6$ compounds.

Applicant respectfully submits that terephthalic acid does not have a similar reactivity to the $C_6H_8O_6$ compounds (ascorbic acid, erythorbic acid, 5,6-carbonyl ascorbic acid, 5,6-erythorbic acid, D-glucuronolactone, isoascorbic acid, or tricarballic acid) taught in Cioffe. Therefore, the Examiner’s reliance on Cioffe as suggesting terephthalic acid is improper. Terephthalic acid is a

conjugated phenolic compound that includes two carboxylic acid moieties attached to a phenyl ring. In contrast, the $C_6H_8O_6$ compounds are not conjugated compounds and, therefore, have different reactivities than the terephthalic acid. As such, the teachings in Cioffe do not suggest the desirability of, or provide an objective reason for, the organic crystalline compounds recited in claim 1.

In addition, the teachings of Cioffe are not sufficient for one of ordinary skill in the art, having the reference before him, to make the proposed modification. Since the teachings of Cioffe are limited to specific $C_6H_8O_6$ compounds and to the fact that compounds having more than six carbon atoms and a similar reactivity to the $C_6H_8O_6$ compounds may be used in the explosive composition, the teachings of Cioffe are insufficient to produce the invention of claim 1, which recites specific, organic crystalline compounds. As previously discussed, Cioffe does not provide any motivation or suggestion for the organic crystalline compounds recited in claim 1. Moreover, “[t]he fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious.” M.P.E.P. § 2144.08. Since the chemical structures and reactivities of the organic crystalline compounds recited in claim 1 are not similar to the chemical structures and reactivities of the $C_6H_8O_6$ compounds taught in Cioffe, one of ordinary skill in the art would not have been motivated by the teachings of Cioffe to use the recited organic crystalline compounds.

Since Cioffe does not teach or suggest all of the limitations of claim 1 and does not provide a motivation to produce the claimed invention, the obviousness rejection is improper and should be withdrawn.

Claims 2-8 and 22 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Cioffe, as applied to claims 1-8 and 22 above, and further in view of U.S. Statutory Invention Registration No. H72 to Wise *et al.*

Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cioffe, as applied to claims 1-8 and 22 above, and further in view of U.S. Statutory Invention Registration No. H72 to Wise *et al.* (“Wise”). Applicant respectfully traverses this rejection, as hereinafter set forth.

The teachings of Cioffe are as previously described.

Wise teaches a black powder substitute that includes potassium nitrate, sulfur, and an organic crystalline compound. Wise at the Abstract. Upon ignition, the sulfur in the black powder substitute is chemically reduced and provides less reactivity to the organic crystalline compound. *Id.* at column 7, line 65 through column 8, line 2 and column 9, line 26 through column 10, line 7. The organic crystalline compound is fluorescein, phenolphthalein, 1,5-naphthalenediol, phenolphthalin, anthraflavic acid, terephthalic acid, alkali metal salts thereof, mixtures thereof, quinalizarin, quinizarin, leucoquinizarin, hydroquinone, catechol, salts thereof, and mixtures thereof. *Id.* at column 2, lines 31-44.

Since claim 10 depends from claim 1, claim 10 includes all of the limitations of claim 1. As such, claim 10 includes the limitation that the explosive composition consists of the recited components. Cioffe does not teach or suggest that its explosive composition consists of the components recited in claim 1 because Cioffe does not teach or suggest the recited organic crystalline compounds, for the reasons previously discussed. Wise also does not teach or suggest that its black powder substitute consists of the components recited in claim 1 because sulfur is present in this black powder substitute.

The cited references also do not provide a motivation to combine to produce the claimed invention because Wise teaches away from combination with Cioffe. The black powder substitutes of Wise include sulfur to provide the desired energetic performance and properties. However, nothing in Wise provides any motivation or suggestion to use organic crystalline compounds, such as phenolphthalein, in an explosive composition that consists of the components recited in claim 1, which does not include sulfur. Cioffe also does not provide any motivation or suggestion to use the recited organic crystalline compounds for the reasons previously discussed.

In addition, even if Cioffe and Wise were combined in the manner asserted by the Examiner, the claimed invention would not be produced because the resulting composition would include sulfur and, therefore, would not consist of the components recited in claim 1.

Since Cioffe and Wise do not teach or suggest all of the claim limitations and do not provide a motivation to combine to produce the claimed invention, the obviousness rejection of

claim 10 is improper and should be withdrawn.

Obviousness Rejection Based on Cioffe, as applied to claims 1-8 and 22 above, and further in view of U.S. Patent No. 5,620,691 to Weber

Claims 16-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cioffe, as applied to claims 1-8 and 22 above, and further in view of U.S. Patent No. 5,620,691 to Weber (“Weber”). Applicant respectfully traverses this rejection, as hereinafter set forth.

The teachings of Cioffe are as previously described.

Weber teaches a black powder substitute that is free of charcoal. Weber at the Abstract. The black powder substitute includes unconverted phenolphthalein, potassium nitrate, and sulfur in a binding phase of phenolphthalein salt. *Id.* at column 1, lines 38-43. The black powder substitute also includes a binder, such as a vinyl alcohol acetate resin or a polyvinyl alcohol resin. *Id.* at column 2, lines 61-66.

Since claims 16-19 depend directly or indirectly from claim 1, these claims include all of the limitations of claim 1. As such, each of claims 16-19 includes the limitation that the explosive composition consists of the recited components. Cioffe does not teach or suggest that its explosive composition consists of the components recited in claim 1 for the reasons previously discussed. Weber also does not teach or suggest that its black powder substitute consists of the components recited in claim 1 because sulfur is present in the black powder substitute.

Since Cioffe and Weber do not teach or suggest all of the claim limitations, the obviousness rejection of dependent claims 16-19 is improper and should be withdrawn.

ENTRY OF AMENDMENTS

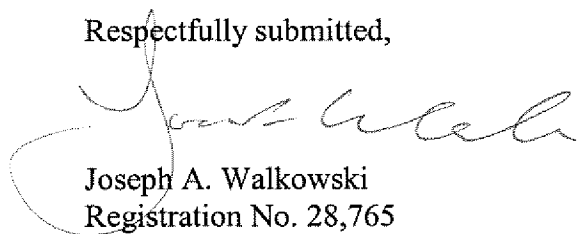
The proposed amendments to claims 1, 5, 16-21, and 68 should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add new matter to the application. Further, the amendments do not raise new issues or require a further search. Finally, if the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

Applicant considers claim 1 to be generic and notes that upon allowance of a generic claim, claims depending therefrom in a non-elected species would also be allowable. As such, claims 11-14, 20, 21, 23-25, 68, and 69 would be allowable as depending from claim 1.

CONCLUSION

Claims 1-8, 10-14, 16-25, 68, and 69 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, she is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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